



PATENT  
PD-8811

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of )  
Michio Asahina ) Group Art Unit: 258  
Serial No.: 07/151,361 ) Examiner: S. Loke  
Filed: February 2, 1988 )  
For: SEMICONDUCTOR DEVICE )

# 19  
/ Reply  
/ Brief

APPELLANT'S REPLY BRIEF

The Honorable Commissioner  
of Patents and Trademarks  
Washington, D.C. 20231

30  
10/30/90

91-2458

Dear Sir:

This is in reply to a new point of argument raised in the Examiner's Answer of September 24, 1990 (Paper No. 18).

NEW POINT OF ARGUMENT

The new point of argument is presented on pages 7 and 8 of the Examiner's answer.

In fact, the nature of the new point of argument presented by the Examiner is such that a reasonable argument could be made that it amounts to a new ground of rejection, even though the statutory basis and the prior art relied upon were not changed.

The new point to which this Reply Brief is directed relates to a primary novel feature of the present invention, which is that an upper conductor structure of the claimed semiconductor device includes "an electroplated or electrolessly plated metal plating layer".

In the Examiner's Answer of September 24, 1990, after the explanation of the manner in which the prior art is applied against the claims on appeal, the Examiner states, in section (11) at the bottom of page 6 of the Answer: "It is true that the transition metal nitrides of Howard is not an electroplated or electrolessly

plated metal layer." Then, between pages 6 and 7 of the Answer, the Examiner states: "It is important to note that the process limitation of how the electrical conductor is formed has no patentable weight in claim drawn to structure."

It is thus clear that the prior art rejections involved in this appeal are now based on the view that the claim recitation of "an electroplated or electrolessly plated layer" is a process limitation which is to be given no weight in a product claim.

Prior to the Examiner's Answer, this view was never stated in connection with the prior art rejections.

In the application, as originally filed, the limitation in question appeared in dependent claims 5-7. In the first Office action in connection with this application, which issued on June 6, 1989, the Examiner asserted that the subject matter of claims 5-7 contained process limitations, but this assertion was presented only in a rejection under 35 U.S.C. §112, fourth paragraph, asserting that those claims were "of improper dependent form". The prior art rejection of claims 5-7 appearing in that action did not indicate that the limitations were not being substantively treated.

Subsequent to the Office action of June 6, 1989, the recitation in question was incorporated into claim 1.

Then, in the final action of November 28, 1989, the Examiner again rejected claims 5-7, inter alia, on the basis of the prior art, asserting, on page 2 of the action, that the rejection was based on the view that the Howard wire structure (composed of a nitride layer) was comparable to the claimed "electroplated or electrolessly plated metal plating layer" because a nitride layer "is just another method to prevent void (crack) beside electroplating or electrolessly plating". On page 3 of the final rejection, the Examiner presented a rejection of claims 5-7, inter

alia, under 35 U.S.C. §112, second paragraph, as being indefinite, and the Examiner stated that these claims were still rejected under the reason as set forth in the first rejection, (Paper No.9). However, in Paper No. 9, claims 5-7 had not been rejected under 35 U.S.C. §112, second paragraph, and there had been no assertion that these claims were indefinite.

Indeed, it is abundantly clear that in the final rejection of November 20, 1989, from which this appeal is taken, the Examiner dealt with the claim limitation in question simply by concluding that the claimed structure was equivalent to the different structure disclosed in the Howard patent.

Now, for the first time, in the Examiner's Answer of September 24, 1990, it is asserted that the prior art rejection is based on the view that the claim recitation in question is a process limitation which is entitled to no patentable weight in a claim drawn to structure.

In the final action of November 20, 1989, claim 1 was not rejected on formal grounds.

Not surprisingly, the Brief on Appeal filed on April 23, 1990, presented no discussion of the issue of process limitations in the pending claims.

RESPONSE TO NEW POINT OF ARGUMENT

In support of the view now expressed by the Examiner, i.e. that the claim recitation in question is a process limitation that can be given no patentable weight, the Examiner cites seven published decisions which, it is submitted, do not support his position with respect to the claim limitation which is here in issue.

Given the inherent limitations of the English language,

there is ample authority for the view that certain apparent "process" words in claims can properly be interpreted as structural limitations when they are used in an adjective non-process sense and adequately define a physical characteristic of the product. Chisum, PATENTS, volume 2, 1990, §8.05[5] (page 8-81).

A leading case on point is In re Garnero, 162 USPQ 221 (CCPA, 1969) (copy attached). Particular attention is drawn to the paragraph extending between the first and second columns on page 223 wherein it is pointed out [that many limitations that may contain process terms are capable of being properly construed as structural limitations.] One such term to which the Court refers is "welded". The Court further states, in the cited section of the decision, that "the correct inquiry therefore, it appears to us, is whether the product defined by claim 1 is patentably distinguished over the prior art". This decision, despite its age, has been cited with approval, and relied upon, in numerous subsequent decisions.

Furthermore, in the present case, the usual objection to product by process limitations is not applicable. An electroplated or electrolessly plated layer does differ in structure from a layer which is formed by evaporation or sputtering, as disclosed by Howard, and this difference is readily discernable by microscopic observation, even with a purely optical microscope. Under such observation, an electroplated or electrolessly plated layer is far more homogeneous.

There is nothing in the prior art relied upon by the Examiner which would suggest to one skilled in the art the obviousness of replacing a layer formed by evaporation or sputtering by an electroplated or electrolessly plated metal plating layer. The advantages offered by the type of layer

contemplated by the present invention have already been discussed in detail in Appellant's Brief of April 23, 1990, particularly at page 6, fourth full paragraph.

As indicated above, the decisions cited by the Examiner are not relevant to, or controlling of, the issue to be decided in this appeal.

In re Marosi et al., 218 USPQ 289, was concerned with the weight to be given the limitation "essentially free of alkaline metal" in a product claim. As in other decisions relating to this point, the Court held that a prior art rejection of a claim containing product-by-process limitations is appropriate if the prior art product appears to be identical. [ In the present case, the Examiner has not refuted appellant's assertion that the layers provided in accordance with the present invention are not, and would not under the type of observation normally employed for such structures, be found identical to the prior art layer structures. ]

Insofar as concerns the Examiners reliance on In re Hirao, et al., 190 USPQ 15, 17 (footnote 3), it must be noted that this decision relates solely to method claims and that the cited footnote simply reiterates the proposition that in ex parte cases, product-by-process claims are not construed as being limited to the product formed by the specific process recited. Since the claims here on appeal are not product-by-process claims, the observations presented in that footnote do not appear to be relevant.

In re Brown et al., 173 USPQ 685, was concerned primarily with the question of whether any differences had been shown to exist between claimed catalysts and catalysts according to the prior art. [ The decision was based essentially on the conclusion that the evidence of record did not clearly establish any unobvious differences between the invention, as claimed, and the prior art. ]

The starting point of this decision was that, in the absence of external evidence, the product disclosed in the prior art appeared to be identical to that claimed. Such a starting point does not exist in the present case because the types of layers defined in the claims on appeal are clearly different from those disclosed in the applied reference.

In re Luck et al., 177 USPQ 523, was concerned with the significance of a recitation relating to the manner in which a specified coating is affixed to a glass member. Interestingly, the Court recognized that the method of application could well result in a difference in the coated article (Page 525) but based its affirmance of the final rejection on the fact that certain applied references teach the use of the material defined in the claim on appeal for affixing the coating. Thus, affirmance of the rejection was based essentially on the presence of a prior art teaching relating to the claim limitation. In the present case, there is no prior art teaching of the provision of an electroplated or electrolessly plated metal plating layer forming part of a conductor structure of a semiconductor device. Thus, In re Luck et al provides clear support for appellant's assertions regarding the weight which must be given to the claim limitation which is here in issue.

In re Fessmann, 180 USPQ 324, was clearly concerned with a true product-by-process claim and the decision was based on the conclusion that no basis existed for concluding that the composition resulting from the claimed process would differ from compositions disclosed in the prior art. The claim at issue in that decision contained no recitation which could be interpreted as identifying any physical characteristic of the claimed product.

In re Avery, 186 USPQ 161, related to a product-by-process

claim that was found to define a product which was considered to be completely disclosed in the prior art. [Prior art relied upon to support the rejection of that claim was found to disclose every physical feature recited in the claim.] The only arguments made by the appellant in support of the rejected product-by-process claim did not relate to any physical aspect of the claimed product. Therefore, this decision does not appear to be particularly relevant to the question which is here in issue.

In re Wertheim, 191 USPQ 90, was concerned with a product claim including clear process limitations and the prior art rejection was affirmed because a prior art reference disclosed a product having parameter values overlapping those recited in the claims. [Thus, the decision in this case was based on the conclusion that all parameters defined in the claims were disclosed in the prior art.]

Similarly, In re Thorpe, 227 USPQ 964, represented a case in which the Examiner provided documentary evidence demonstrating that the claimed product was known in the art. This decision noted that the appellant had not asserted that the product of his process was different from the product of the prior art. Thus, whatever basis there existed for this decision, it does not support the Examiner's position in the present case.

In re Pilkington, 162 USPQ 145, 147, interestingly, involved a case in which the rejection of clear product-by-process claims was reversed even though the differences between the claimed product and prior art products were of a nature which could be viewed as a matter of degree. Therefore, there is nothing in this decision which can support the Examiner's view.

Finally, Johnson & Johnson v. W.L. Gore, 195 USPQ 487, is a District Court case which relates to an issued patent. It is

generally recognized that the claims of issued patents are interpreted in ways different from the claims of pending applications. Nevertheless, it is of interest to note that on the page particularly cited by the Examiner, page 506, the Court found the product-by-process claims of the patent to be valid. Nothing has been found in this decision which could be considered to support the Examiner's view in the present case.

\* \* \* \*

The Examiner's Answer presents a new rationale for his prior art rejection of the claims and the Examiner has attempted to support this rationale by the citation of a large number of decisions which, for reasons advanced above, do not appear to provide support for that rationale. They have, however, necessitated a discussion of each of those decisions.

\* \* \* \*

In point of fact, all of the decisions discussed above appear to consistently express the view that every definite limitation in a claim must be taken into account, [or given "weight", to the extent that they have some physical connotation. If a claim limitation can properly be considered to define a physical aspect of a claimed structure, its significance must be judged relative to the prior art. In the present case, an electroplated or electrolessly plated metal layer has observable physical characteristics not possessed by a vapor deposited or sputtered metal layer. Therefore, it is believed that consideration of those decisions must lead to the conclusion that the claim limitation which is here in question must, in any event, be substantively considered.

The issue in this case remains that the prior art does not disclose layers of the nature defined in the claims on appeal and

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does not present any evidence that it would be obvious to replace the layer compositions disclosed in the prior art by the claimed layers. Moreover, the present specification clearly establishes that the types of layers employed in a semiconductor device according to the present invention will offer significant advantages over layers disclosed in the prior art.

Under these circumstances, the final rejection of the claims is unsupported by the prior art, and reversal of that rejection is solicited.

The present Reply Brief is being submitted in triplicate.

October 23, 1990

Respectfully submitted,

  
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nitrato on it, into an electric furnace at 350 °C. This temperature was below the strain point of the cover glass and above the melting point of potassium nitrate. On the morning of February 10, I observed that the glass cover slip was rather strongly compressed down due to compression resulting from replacement of sodium ions with potassium ions. Similar experiments were performed February 10 and similar results were observed that day and on February 11.

Repeated reductions to practice were accomplished in a similar manner during the period March 3-8, 1960 (pages 15-24). The radius of curvature of several exchanged cover slips were determined graphically employing the calculations shown in the entries dated February 29, 1960 and March 2, 1960. The radius of curvature determination was based on interference ring distance measurements.

During the period March 17-19, 1960 (pages 37 and 38) I again reduced my invention to practice, and determined the radius of curvature and the compressive force ( $F_a$ ) in the surface layer.

Drs. Christensen, Ryan and Baer were familiar with the details of my "Strength and Failure of Glass" project. They observed my equipment and the bottles of chemical reagents employed, my notebook and the diffraction or interference rings present in the treated cover slips during this period as set forth in their affidavits.

I diligently continued working on the project and prepared a patent disclosure entitled "Increasing Strength of Glass by Diffusing Large Ions into the Surface". (Exhibit 8). I also prepared a memorandum dated July 19, 1960 supplementing my disclosure (Exhibit 12). To the best of my knowledge and belief, my disclosure and memorandum were forwarded in July of 1960 to the Research Corporation by Dr. Christensen, Coordinator of Cooperative Research at the University of Utah. I wrote a letter to Mr. Yates of Research Corporation discussing my work on August 5, 1960 (Exhibit 15), and letters to Mr. Stowell their patent attorney containing further data on September 19, 1960 (Exhibit 23) and informing him that no further data would be available in the immediate future on October 14, 1960 (Exhibit 26). The completed application was sent to me for execution by letter dated October 25, 1960 (Exhibit 26) and for notarization of my signature by letter dated November 3, 1960 (Exhibit 28). The appli-

cation was filed in the Patent Office on November 15, 1960.

The relevant substance of each of the affidavits of Baer, Ryan and Christensen consists of the following averments, made as of March 1960:

THAT he knows and has been associated professionally in the Department of Chemical Engineering of the University of Utah with Samuel S. Kistler, applicant in the above-identified application, and is familiar with Kistler's work on the strengthening of glass.

THAT in 1959 and 1960 Kistler performed his experiments on the strengthening of glass in a room frequented by various members of the Department of Chemical Engineering and that bottles of chemical reagents, the furnace, the microscope, and the notebook used by Kistler were readily apparent;

THAT on various occasions, sometime about January or February, 1960, he observed Kistler treating glass cover slips and that he viewed under the microscope glass cover slips curved by Kistler's treatment and observed circular diffraction rings in the curved glass slips.

Christiansen also averred:

THAT he is the E. B. Christiansen who signed Kistler's research proposals to the National Science Foundation and to the Owens-Illinois Technical Center dated March 26, 1958 and September 18, 1959, respectively.

The Christiansen affidavit reads in part:

THAT since 1946 he has been associated with the University of Utah and that he knows Samuel S. Kistler, applicant in the above-identified application, and is familiar with Kistler's work in the strengthening of glass; and

THAT he is the Carl J. Christensen, Coordinator of Cooperative Research, who signed Kistler's research proposals to the National Science Foundation and to the Owens-Illinois Technical Center dated March 26, 1958 and September 18, 1959, respectively.

With respect to the adequacy of Kistler's affidavits and exhibits, the entirety of the board's opinion reads:

We agree with Weber's position that Kistler's showing is fatally inadequate, at least from the standpoint of corroboration and testing, as it does not appear from Kistler's own testimony that he subjected the product of his process to tests, or from the

corroborating affidavits that his supporting witnesses had knowledge adequate to supply vitally necessary corroborative as to reduction to practice or diligence.

#### PATENTS

1. Claims—Article defined by process of manufacture (§ 20.15)

Mere presence of method limitation in article claim which is otherwise allowable does not so poison claim as to render it unpatentable.—*In re Garnero* (CCPA) 162 USPQ 221.

2. Claims—"Comprising," "Consisting," etc. (§ 20.30)

"Consisting essentially of" terminology in claim excludes additional unclaimed ingredients which would affect basic and novel characteristics of product defined in balance of claims.—*In re Garnero* (CCPA) 162 USPQ 221.

#### Particular patents—Structural Material

*In re Garnero*, Structural Material of Expanded Minerals and Method for Manufacture, claims 1 and 9 of application allowed.—*In re Garnero* (CCPA) 162 USPQ 221.

#### Appeal from Board of Appeals of the Patent Office.

Application for patent of Anthony L. Garnero, Serial No. 381,145, filed July 8, 1964, Patent Office Group 160. From decision rejecting claims 1 and 9, applicant appeals. Reversed.

See also 145 USPQ 457.

HERMAN HERSH and McDougall, HERSH, SCOTT & LADD, both of Chicago, Ill. (GEORGE A. DEGNAN, Washington, D. C., of counsel) for appellant.

JOSEPH SCHIMMEL (FRED W. SHERLING, of counsel) for Commissioner of Patents.

Before RICH, Acting Chief Judge, HORSTZOFF and McLAUGHLIN, Judges, sitting by designation, and ALMOND and BALDWIN, Associate Judges.

BALDWIN, Judge.

This appeal is from the Patent Office Board of Appeals decision affirming the examiner's rejection of two claims<sup>1</sup> of appellant's application<sup>2</sup> as unpatentable.

<sup>1</sup> The rejections of only claims 1 and 9 are pursued on appeal here.

<sup>2</sup> Serial No. 381,145, filed July 8, 1964, for "Structural Material or Expanded Minerals and Method for Manufacture," allegedly a continuation of application serial No. 714,831, filed February 12, 1968, for "Structural Material of Expanded Minerals and Method for Manufacturing."

The parent application was before this

under 35 U.S.C. 103, claim 1 being rejected on Thomas<sup>3</sup> in view of Pierce<sup>4</sup> and claim 9 being rejected on the same combination of references further in view of Ford.<sup>5</sup> No claim has been allowed.

#### The Invention

The invention relates to a thermal insulation panel formed from expanded perlite particles. The particles are held together without any additional material, such as an external bonding agent, by interfusion between the surfaces of the perlite particles. Interfusion is effected by taking the initially unexpanded perlite particles and heating them rapidly for expansion so that combined water associated with the particles is released as a vapor which operates as a flux which enables the particles to become stuck together at temperatures as low as 1400 F.<sup>6</sup> The specification describes the product as "having a density which may vary from 1 pound per cubic foot to as much as 80 pounds per cubic foot while still maintaining a porosity and a mass integrity sufficient to enable use thereof as a structural insulation material."

Claims 1 and 9 read:

1. A composite, porous, thermal insulation panel characterized by dimension in in. re Garnero, 52 CCPA 1370, 345 F.2d 589, 145 USPQ 457 (1965), and we there affirmed the rejection of claims directed to a method of manufacturing an expanded perlite structure as being obvious under 35 U.S.C. 103 in view of certain, different prior art cited in that case.

3. U. S. Patent 2,600,812, issued June 17, 1952.

4. U. S. Patent 2,517,235, issued August 1, 1950.

5. U. S. Patent 2,691,248, issued October 12, 1954.

6. Thus, appellant's specification states:

"Fusion believed to be necessary for adhesion occurs with the average perlite at a temperature within the range of 2000-2200° F. It has been found, however, that the combined water which is released as a vapor when the perlite particles are heated to a pyroplastic state operates as a flux which enables the desired stickiness to develop for agglomeration when the particles are heated to a temperature as low as 1400° F. but preferably at a temperature above 1600° F. Thus agglomeration can be achieved at a temperature starting at 1400° F. Best adhesions and expansions are secured when the particles are heated to a temperature above 1800° F. Thus the preferred conditions for operation from the standpoint of expansion and agglomeration will reside in heating the particles to a temperature of 1800-2200° F.

sional stability and structural strength consisting essentially of expanded perlite particles which are interbonded one to another by interfusion between the surfaces of the perlite particles while in a pyroplastic state to form a porous perlite panel.

9. An insulation panel as claimed in Claim 1 in which the panel is formed in cross-section with layers of different densities.

#### The References

Thomas discloses a pipe insulating composition which utilizes sodium silicate as a binding agent to hold already expanded perlite particles together, with sodium chloride being used as a setting agent. A mixture of the expanded perlite, the sodium silicate binder, and the sodium chloride setting agent are subjected to a compression from 5 to 7 tons per square foot, at ambient temperature, to produce articles formed of the composition. Prior to compression, Thomas' aggregate mixture has a density of 4 to 10 pounds per cubic foot. Pierce discloses a building material utilizing expanded perlite particles which are mixed with hot hydrated lime (CaO) at a temperature of about 300° F. Pierce states that "the exterior of the granules reacts chemically to bind the entire mass together." The specification discloses that the end product may have a density of 40-50 pounds per cubic foot.

Ford discloses cellular glass pellets having a core of highly cellulated glass, an intermediate layer of less highly cellulated glass, and an outer layer of substantially uncultulated glass, thus demonstrating a panel having a cross-section of varying density.

#### The Rejection

Sustaining the examiner's rejection of claim 1 as being unpatentable over Thomas in view of Pierce under 35 U.S.C. 103, the board stated:

The language used by Pierce is considered to be readable on "interbonding by interfusion" as expressed in the claims at issue. Albeit that the condition limitations appear to differ somewhat from the details of the process described by the patentees, we are apprised of no facts which would lead us to conclude that the instantly claimed product necessarily would be patentably unique when compared to that resulting from the prior art methods.

The board rejected arguments by appellant that the inclusion in the claim of the phrase "consisting essentially of" would exclude the presence of an ex-

ternal binder and thus distinguish from the composition of Thomas which uses a sodium silicate binder and that the phrase "expanded perlite particles which are interbonded one to another by interfusion between the surfaces of the perlite particles" is as capable of distinguishing from the chemical bonding of Pierce which employs lime as an additional ingredient. Instead the board noted the existence of other claims (now cancelled) adding other limitations to claim 1 and stated:

[T]he recital of "consisting essentially" renders a claim open only for the inclusion of unspecified ingredients which would not materially affect the basic and novel characteristics of the product defined in the balance of the claim. \* \* \* Where, as here, other claims indicate that particular components are not excluded by the words "consisting essentially of", appellant's arguments as to the existence of diverse reaction mechanisms in the prior art processes cannot be accepted as conclusive of a factual patentable distinction in his claimed product.

The examiner's rejection of claim 9 on the ground that the feature of different densities in different layers would be an obvious modification in view of Ford, was affirmed by the board in that:

Appellant has urged no patentable merit in the specific modifications set forth in claims 5 through 9, and we perceive none.

#### Opinion

On appeal the solicitor's position appears to be that the only distinction between appellant's product and the products of the prior art is the process by which appellant's product is made, and, as that process has been found to be unpatentable in our previous decision of In re Garnero, 52 CCPA 1370, 345 F.2d 589, 145 USPQ 457 (1965), then the product claims are likewise unpatentable. The solicitor is in effect reading claim 1, which recites "expanded perlite particles which are interbonded one to another by interfusion between the surfaces of the perlite particles while in a pyroplastic state to form a porous perlite panel," as a product claim containing a process limitation and then applying the rationale expressed by this court in In re Stephens, 52 CCPA 1015, 1409, 345 F.2d 1020, 145 USPQ 656 (1965); and In re Dillnot, 49 CCPA 1015, 300 F.2d 945, 133 USPQ 289 (1962).

The trouble with the solicitor's approach is that it necessarily assumes that claim 1 should be construed as a prod-

uct claim containing a process, rather than structural, limitation. However, it seems to us that the recitation of the parties as "interbonded one to another by interfusion between the surfaces of the perlite particles" is as capable of being construed as a structural limitation as "intermixed," "ground in place," "press fitted," "clched," and "welded," all of which at one time or another have been separately held capable of construction as structural, rather than process, limitations. The correct inquiry therefore, it appears to us, is whether the product defined by claim 1 is putatively distinguishable over the disclosures of Thomas and Pierce in view of the "structural" limitation defining the panel as "consisting essentially of expanded perlite particles \* \* \* interbonded one to another by interfusion between the surfaces of the perlite particles." Neither Thomas nor Pierce disclose expanded perlite particles interbonded one to another by interfusion between the surfaces thereof; it is not therefore reasonable to view such interbonding to be obvious by considering the references collectively.

[2] Moreover, the "consisting essentially of \* \* \*" terminology would, as the board pointed out, exclude additional unspecified ingredients which would affect the basic and novel characteristics of the product defined in the balance of the claim. However, to follow the teachings of Thomas combined in any manner with Pierce, would require the presence of additional material with the expanded perlite, whether it be the sodium silicate binder of Thomas or the hydrated lime which Pierce uses to provide a chemical joining action. In either event it cannot be said that the additional ingredient would not materially affect the basic construction as structural, rather than structural, limitation. However, it seems to us that the recitation of the parties as "interbonded one to another by interfusion between the surfaces of the perlite particles while in a pyroplastic state to form a porous perlite panel," as a product claim containing a process limitation and then applying the rationale expressed by this court in In re Stepan, 52 CCPA 791, 394 F.2d 1013, 156 USPQ 143 (1967), in which we found that use of the term "condensation product" in a chemical claim to a product did not thereby render the claim a product-by-process claim.

See also a recent decision of this court in re Stepan, 52 CCPA 791, 394 F.2d 1013, 156 USPQ 143 (1967), in which we found that use of the term "condensation product" in a chemical claim to a product did not thereby render the claim a product-by-process claim.

[3] Taking the view do that the just recited limitation is structural in nature we do not find it necessary to consider the additional recitation "while in a pyroplastic state." \* \* \* as the mere presence of a method limitation in an article claim which is otherwise allowable would not so poison the claim as to render it unpatentable. Ex parte Lindberg, 157 USPQ 606 (P.O. Bd. App. 1967).

and novel characteristic of appellant's product which is that the perlite particles are held together without any additional material.

The rejections of claims 1 and 9 are therefore reversed. As to claims 2 and 5-8, the other claims initially appealed but not pursued, the appeal is dismissed. McLAUGHLIN, Judge, concurs in the result.

Court of Customs and Patent Appeals

In re JONES  
No. 8099 Decided July 3, 1969

PATENTS

Particular patents—Polypropylene

Jones, Filled Polypropylene, claims 1 and 2 of application refused.—In re Jones (CCPA) 162 USPQ 224.

Appeal from Board of Appeals of the Patent Office.

Application for patent of Roger F. Jones, Serial No. 123,096, filed July 11, 1961; Patent Office Group 140. From decision rejecting claims 1 and 2, applicant appeals. Affirmed.

ROGER V. N. POWELSON and DONALD R. JOHNSON, both of Philadelphia, Pa., for appellant.

JOSEPH SCHIMMEL (JOSEPH F. NAKAMURA of counsel) for Commissioner of Patents.

Before WORLEY, Chief Judge, and RICH, ALMOND, and BALDWIN, Associate Judges.

BALDWIN, Judge.

Jones appeals from the Patent Office Board of Appeals decision affirming the examiner's rejection of claims 1 and 2, the only remaining claims in his application,<sup>1</sup> as unpatentable over Ward, Blake,<sup>2</sup> and Orzechowski,<sup>3</sup> taken in combination, under 35 U.S.C. 103.<sup>4</sup>

Serial No. 123,096, filed July 11, 1961, for "Filled Polypropylene,"<sup>5</sup> U.S. Patent 3,165,542, issued January 19, 1955, on an application filed February 19, 1958.

U.S. Patent 2,992,799, issued July 25, 1961, on an application filed August 20, 1957.

U.S. patent 3,165,542, issued January 19, 1955, on an application filed February 19, 1958.

In his brief, appellant has urged that "in the latter part of its opinion the

The Invention

The invention relates to blends containing polypropylene and anthophyllite asbestos.<sup>6</sup> The specification indicates that articles molded from asbestos-filled polypropylene generally "exhibit enhanced tensile and flexural modulus"; however, under certain circumstances, specifically where the articles are to sustain prolonged exposure to moderately high heat, the asbestos-filled compositions tend to oxidize and degrade more rapidly than unfilled polypropylene. Appellant has discovered that anthophyllite asbestos accelerates the oxidative degradation to a far lesser extent than do other asbestos.

The appealed claims read:

1. As a new composition of matter, a blend of crystalline polypropylene and anthophyllite asbestos, wherein the weight percent of asbestos is from 10% to 85%, together with a small but effective amount of an inhibitor against thermal and oxidative degradation.
2. The composition according to Claim 1 in which the weight percent asbestos is from 30% to 60%.

The References

Ward discloses compositions of asbestos with thermosetting resins, a number of which are listed as being applicable, and all types of asbestos are disclosed as acceptable. The preferred composition, however, comprises phenol-formaldehyde condensation resin with anthophyllite asbestos which has been chemically treated to eliminate acid soluble metallic constituents. The compositions

Board of Appeals is apparently rejecting the claims as not being supported by sufficient disclosure.<sup>7</sup> We do not consider that the board was postulating a new ground of rejection under Rule 196(b) but rather was only commenting on the adequacy or the showing of unexpected results.

Asbestos is the generic name given to a group of naturally-occurring, fibrous magnesium silicate minerals. There are two basic types: serpentine or long-fiber asbestos (chrysotile) and amphibole or short-fiber asbestos (tremolite, actinolite, amosite, crocidolite, and anthophyllite). The latter type combine various amounts of iron, calcium and sodium silicates with the magnesium silicate. They are said to be generally brittle and cannot be spun, as can chrysotile, but are more resistant to chemicals and heat. Condensed Chemical Dictionary 113 (6th ed. 1951).

720° and 310° F. are the only two temperatures mentioned in the specification. The intended use for the compositions may be "under the hood of an automobile in distributor caps, for example."

are intended for use in extremely high temperature situations such as are encountered by rockets.<sup>8</sup> The compositions may be molded for use as an insulating liner or as part of the structure of the rocket itself.

Blake discloses lightweight, fireproof construction materials consisting of asbestos, another filler (which is inert) and a plasticizer mixed with a resinous plastic, which may be either thermosetting or thermoplastic. The asbestos comprises "about 15%" of the mixture, is not defined more specifically, but is said to give "to the product its character," one element of which is increased tensile strength. Polyethylene was specifically tested as one component of the mixture.

Orzechowski is directed to a process for producing highly crystalline polyolefins, among which are polyethylene and polypropylene. The patent discloses that the crystalline polymers so produced "can be subjected to such after-treatment as may be desired to fit them for particular uses or to impart desired properties," for example, the incorporation of antioxidants, stabilizers, plasticizers, pigments, and fillers, such as the silicas.

In addition to the references employed in the rejection, the record includes page 113 of the Condensed Chemical Dictionary,<sup>9</sup> originally cited by the examiner but discarded prior to his final action, and page 136 of the Kirk-Othmer Encyclopedia of Chemical Technology,<sup>10</sup> originally called to the examiner's attention by appellant and relied on in his brief here as support for certain arguments.

The Rejection

The board viewed the examiner's position as follows:

8 Part of the difficulty with this case arises from the examiner's use of Ward to show that anthophyllite asbestos has been preferred before in "heat resistant" applications. The "heat resistance" contemplated by Ward refers to the ability to withstand extremely high temperatures (in the order of 4000° F.) but only for short periods of time, while appellant's use of the term comprehends continuous exposure to heat at only moderate levels but for considerably extended periods of time. Considered to this respect, Ward does not suggest appellant's "heat resistance." We feel, however, that the reference remains pertinent as an indication that the art is aware of the varying properties of the different forms of asbestos from which the determination of the preferred form may be obvious. This position is fortified by the disclosures of two additional publications also included in

\* \* \* [S]ince the anthophyllite type has been used as the preferred form of asbestos to fill thermosetting resins for high temperature applications, such as rocket liners, as shown by Ward, and since asbestos generally has been used to fill both thermosetting and thermoplastic resins, such as the well-known filled crystalline polypropylene as shown by Orzechowski. The latter is also relied upon to show the use of a variety of asbestos as the filler in the thermoplastic resins, such as the well-known filled crystalline polypropylene by Ward, and since the Blake patent was not mentioned in this statement, but since that patent was relied upon by the examiner to show that it was known to employ asbestos as a filler with thermoplastic or thermosetting resins to produce materials having improved tensile strength, we presume that it was also relied upon by the board.

The Blake patent was not mentioned in this statement, but since that patent was relied upon by the examiner to show that it was known to employ asbestos as a filler with thermoplastic or thermosetting resins to produce materials having improved tensile and flexural modulus as insufficient since there was no comparison of the effects of the different types of asbestos.<sup>11</sup> Appellant's use of the term "catalyze," to describe the effect of the asbestos in increasing the rate of degradation was then seized upon, and combined with Ward's disclosure that he treated the anthophyllite to remove acid soluble constituents, to justify the conclusion that "some sort of chemical interaction between the asbestos and polypropylene" occurs. Using this conclusion, the board then determined that the showing in Table II of the specification, which did compare the different types of asbestos as to their effect on the rate of heat degradation in blends with polypropylene, was insufficient.

11 Table I on page 4 of appellant's specification is a comparison of the structural properties of anthophyllite asbestos filled polypropylene with unfilled polypropylene. It contains no comparative showing as to other types of asbestos. Appellant states in his brief, however, that this table was placed in the specification only to show the prosecution of the case that the improvement in tensile and flexural modulus was in any way unexpected."

<sup>1</sup> New York, Reinhold (6th ed. 1961).

<sup>2</sup> 10 New York, Interscience (Vol. 2, 1948).